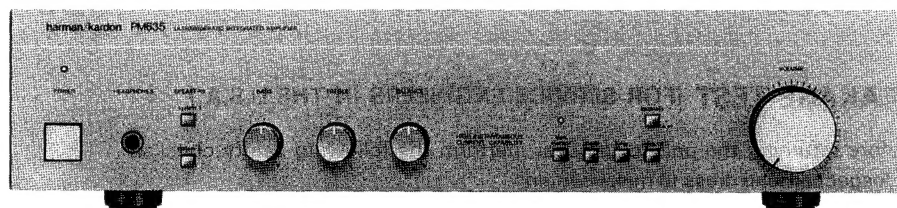


# The Harman Kardon Model PM635

Manual 103A

## ULTRAWIDEBAND INTEGRATED AMPLIFIER

# Technical Manual



PM635

**harman/kardon**

240 Crossways Park West, Woodbury, N.Y. 11797  
1112-3152103A7 P-088606 1850 Printed in Japan

## SPECIFICATIONS

	Nominal	Limit
RMS Output Power		
8Ω, 1kHz, THD 0.09%	40W	≥ 30W
4Ω, 1kHz, THD 1%	55W	≥ 50W
High Instantaneous Current Capability (HCC)	18A	
Half Power Bandwidth	10Hz ~ 70kHz	
Frequency Response at -3dB	0.5Hz ~ 125kHz	
Usable Sensitivity		
Video/CD, Tuner, Tape	135mV ± 25mV	
Phono	2.2mV ± 0.3mV	
Signal to Noise Ratio		
Video/CD, Tuner, Tape	85dB	≥ 78dB
Phono	80dB	≥ 72dB
Channel Separation at 10kHz		
Video/CD, Tuner, Tape	53dB	≥ 45dB
Phono	57dB	≥ 45dB
IM Distortion Ratio	0.15%	≤ 0.2%
Damping Factor at 1kHz	63	≥ 60
Tone Control Characteristics		
Bass at 50Hz		
Boost	10dB	± 2dB
Cut	-10dB	± 2dB
Treble at 10kHz		
Boost	10dB	± 2dB
Cut	-10dB	± 2dB

	Nominal	Limit
Loudness Control (with Volume control at -40dB)		
at 10kHz	3dB	± 1dB
at 50Hz	10dB	± 2dB
DC Output Voltage		
L channel	0mV	± 60mV
R channel	0mV	± 60mV
RIAA Equalization	1.2dB	<sup>+1.8</sup> <sub>-0.5</sub> dB / 0.3dB <sup>+1.0</sup> <sub>0</sub> dB
at Tape Out (20Hz/20kHz) (No load)		
Phono Overload (No load)	190mV	≥ 150mV
Dimensions (W × H × D)	17-1/2" × 4-1/16" × 13-7/8"	
	(443 × 103 × 353 mm)	
Weight	12 lbs. 2 oz.	(5.5 kg)
Power Supply		
U.S.A. model	AC 120V, 60Hz	
General model	AC 220/240V, 50/60Hz	
Japan model	AC 100V, 50/60Hz	
Power Consumption		
U.S.A. model	220W	(242VA)
General model	190W	
Japan model	110W	

This specification is the target of servicing. But, there is a case that the specification is not applicable to the measurement condition and instrument.

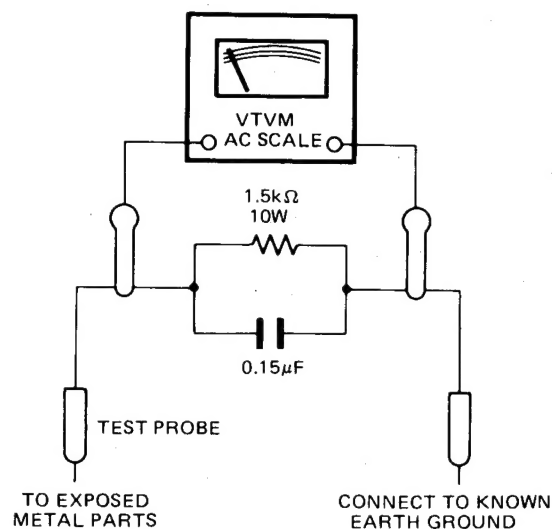
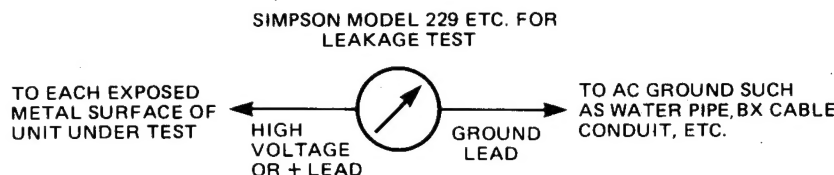
Specifications and components subject to change without notice. Overall performance will be maintained or improved.

## LEAKAGE TEST (FOR SERVICE ENGINEERS IN THE U.S.A.)

Before returning the unit to the user, perform the following safety checks:

1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the unit.
2. Be sure that any protective devices such as nonmetallic control knobs, insulating fishpapers, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacity networks, mechanical insulators, etc. which were removed for servicing are properly reinstalled.
3. Be sure that no shock hazard exists; check for leakage current using Simpson Model 229 Leakage Tester, standard equipment item No. 21641, RCA Model WT540A or use alternate method as follows: Plug the power cord directly into a 120-volt AC receptacle (do not use an Isolation Transformer for this test). Using two clip leads, connect a 1500 Ohm, 10-watt resistor paralleled by a 0.15 μF capacitor, in series with all exposed metal cabinet parts and a known earth ground, such as a water pipe or conduit. Use a VTVM or VOM with 1000 Ohms per volt, or higher, sensitivity to measure the AC voltage drop across the resistor. (See Diagram.) Move the resistor connection to each exposed metal part having a return path to the chassis (antenna, metal, cabinet, screw heads, knobs and control shafts, escutcheon, etc.) and measure the AC voltage drop across the resistor. (This test should be performed with the power switch in both the On and Off positions.)

A reading of 0.35 volt RMS or more is excessive and indicates a potential shock hazard which must be corrected before returning the unit to the owner.



## ALIGNMENT PROCEDURES (REFER TO PAGES 11 AND 12)

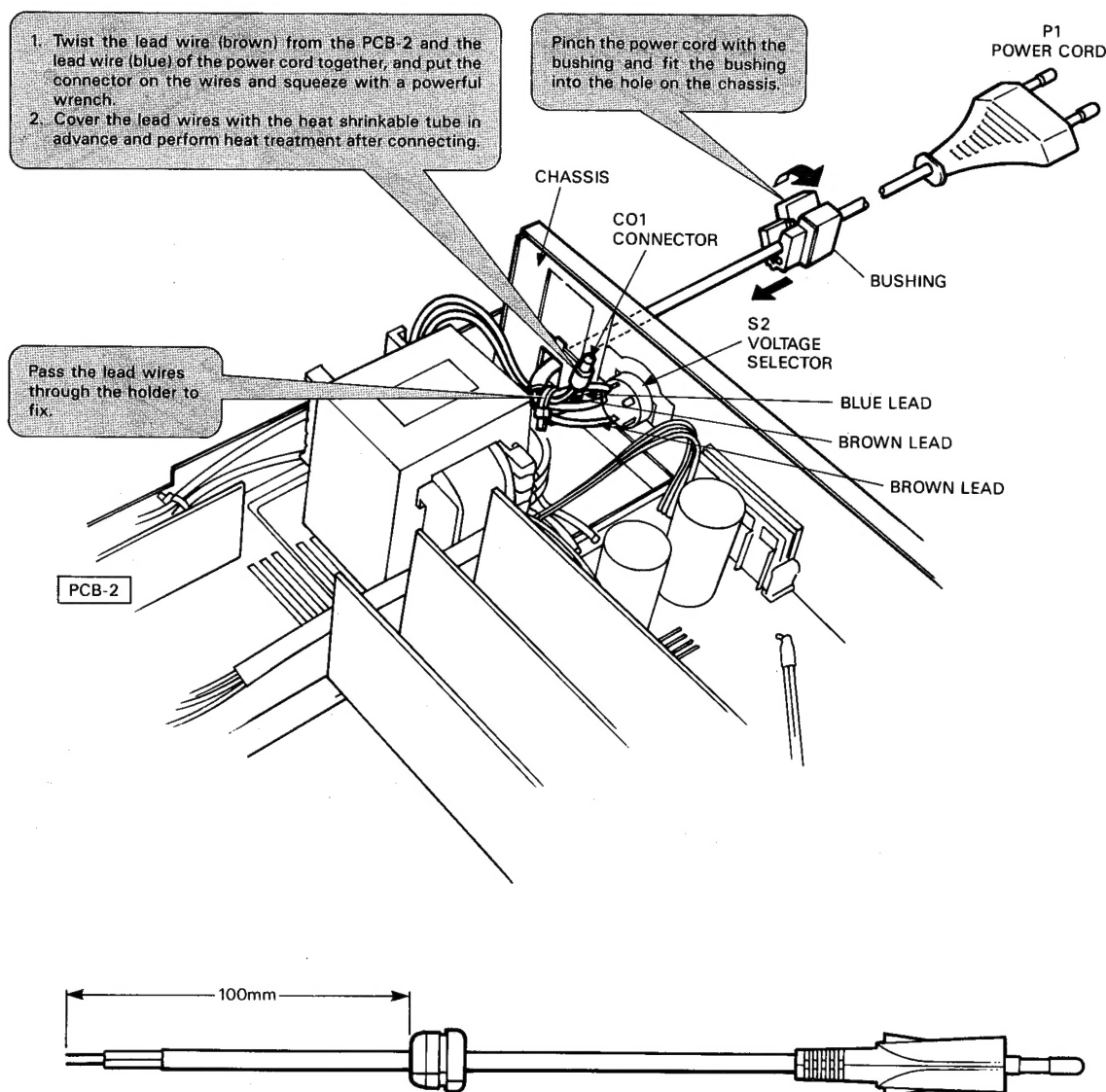
### IDLING ADJUSTMENTS

- Conditions:
- Press the video/CD switch.
  - Set the speaker system switches 1 and 2 to OFF.
  - Set the volume to minimum.

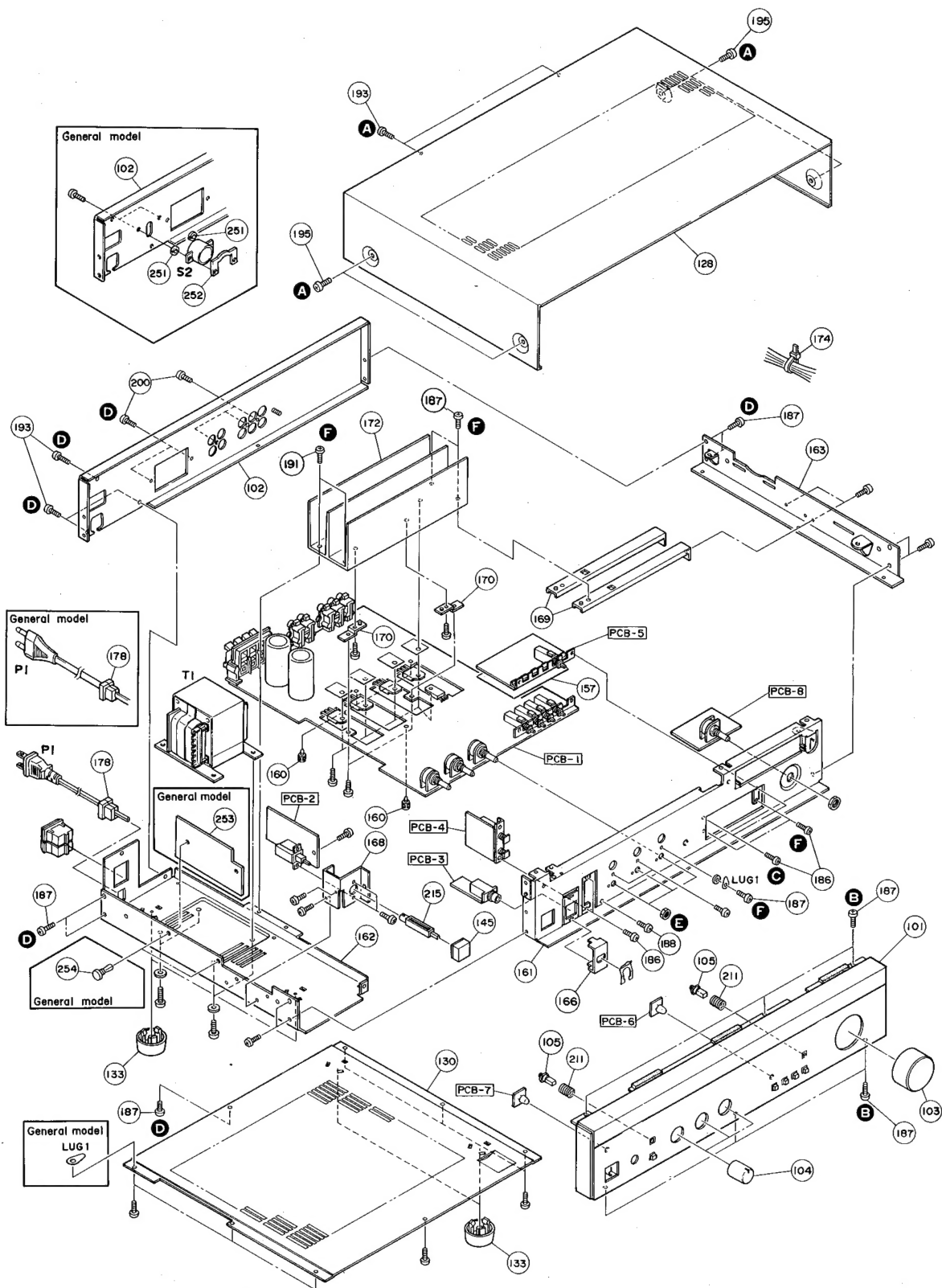
Step	Connections required	Adjustment location	Adjustment value
1	Connect the digital voltmeter to TP1 and TP2.	VR401 (L channel)	36mV
2	Connect the digital voltmeter to TP3 and TP4.	VR402 (R channel)	36mV
3	Repeat steps 1 and 2 after aging for 15 minutes.	VR401/VR402	36mV/36mV

### POWER CORD REPLACEMENT (FOR SERVICE ENGINEERS OTHER THAN NORTH AMERICA)

In order to prevent fire or shock hazard when replacing the power cord, follow the procedure below to replace the parts with the standard supply parts.



## GENERAL UNIT EXPLODED VIEW



## DISASSEMBLY PROCEDURES (REFER TO PAGES 4 AND 9)

### ① CABINET TOP (128) REMOVAL

Remove 6 screws **A** and then remove the Cabinet Top (128).

### ② FRONT PANEL ASSEMBLY (101) REMOVAL

1. Remove the Cabinet Top (128), referring to the previous step ①.
2. Pull off Volume, Bass, Treble and Balance Knobs (103 and 104).
3. Open the lid of connector (CN404) on the Main P. C. Board (PCB-1) and then disconnect the lead wires.
4. Remove 6 screws **B** mounting the front panel assembly with Tape Monitor Indicator and Power Indicator P. C. Boards (PCB-6 and PCB-7), and pull the them toward you to remove.

### ③ LOUDNESS SWITCH P. C. BOARD (PCB-5) REMOVAL

1. Remove the front panel assembly (101), referring to the previous step ②.
2. Open the lid of connectors (CN407, CN605 and CN606) on the Loudness Switch P. C. Board (PCB-5) and then disconnect the lead wires.
3. Remove 2 screws **C** and then remove the Loudness Switch P. C. Board (PCB-5).  
If necessary, unsolder the lead wires.

### ④ MAIN P. C. BOARD (PCB-1) REMOVAL

1. Remove the Loudness Switch P. C. Board (PCB-5), referring to the previous step ③.
2. Open the lid of connectors (CN601 and CN602) on the Volume P. C. Board (PCB-8) and then disconnect the lead wires.
3. Remove 13 screws **D** and then remove Cabinet Back Assembly (102).
4. Remove 3 hexagonal nuts **E**.
5. Remove 7 screws **F** and then remove the Main P. C. Board (PCB-1) backward.  
If necessary, unsolder the lead wires.

## GENERAL UNIT PARTS LIST

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
101	A443-PM635A	Front Panel Ass'y <b>U G</b>	161	2211-7279	Chassis
101	A443-PM635B	Front Panel Ass'y <b>BK GB N</b>	162	2211-7272	Chassis
102	A424-PM635A	Cabinet Back Ass'y <b>U BK</b>	163	2211-7273	Chassis
102	A424-PM635C	Cabinet Back Ass'y <b>G GB</b>	166	2219-7879	Bracket
102	A424-PM635E	Cabinet Back Ass'y <b>N</b>	168	2219-7987	Bracket
103	A630-PM635A	Knob Ass'y, Volume <b>U G</b>	169	2219-8057	Bracket
103	A630-PM635C	Knob Ass'y, Volume <b>BK GB N</b>	170	2219-8060	Bracket
104	A630-PM635B	Knob Ass'y, Bass, Treble, Balance <b>U G</b>	172	2222-7189	Heat Sink <b>U BK</b>
104	A630-PM635D	Knob Ass'y, Bass, Treble, Balance <b>BK GB N</b>	172	2222-7205	Heat Sink <b>G GB</b>
105	A662-PM635A	Push Button Ass'y, Speaker System 1/2, Tape Monitor, Phono, Tuner, Video/CD, Loudness <b>U G</b>	174	2240-7120	Holder
105	A662-PM635B	Push Button Ass'y, Speaker System 1/2, Tape Monitor, Phono, Tuner, Video/CD, Loudness <b>BK GB N</b>	178	2240-364	Holder
128	1414-04601	Cabinet Top	186	2327-300629	Screw (3×6mm)
130	1424-16501	Cabinet Bottom	187	2347-300629	Screw (3×6mm)
133	1319-0139	Foot	191	2347-300826	Screw (3×8mm)
145	1660-00401	Push Button, Power <b>U G</b>	193	2347-300646	Screw (3×6mm)
145	1660-00403	Push Button, Power <b>BK GB</b>	195	2347-400646	Screw (4×6mm)
157	2216-7165	Shield Plate	200	2347-301046	Screw (3×10mm)
160	2132-7139	Spacer	211	2651-210189	Spring
			215	2672-7018	Lever
			251	2132-7116	Spacer <b>S GB</b>
			252	2440-7017	Special Nut <b>G GB</b>
			253	2224-7115	Insulator <b>G GB</b>
			254	2459-3003511	Rivet <b>G GB</b>
				1111-J30237	Owner Guide <b>U BK</b>
				1111-J30238	Owner Guide <b>G GB</b>
				1111-J2031	Owner Guide <b>N</b>
				1221-847144	Packing Box
				1222-7216	Packing Cushion

## ELECTRICAL PARTS LIST

Ref.No.	Part No.	Description
<b>CHASSIS MISCELLANEOUS</b>		
△ PI	4161-71151	Power Cord <b>U</b> <b>BK</b>
△ PI	4161-7256	Power Cord <b>G</b> <b>GB</b>
△ PI	4161-71133	Power Cord <b>N</b>
△ TI	5584-701526	Power Transformer <b>U</b> <b>BK</b>
△ TI	5584-701532	Power Transformer <b>G</b> <b>GB</b>
△ TI	5584-701536	Power Transformer <b>N</b>
△ FI	5732-252031	Fuse, 2A, 125V <b>U</b> <b>BK</b>
△ FI	5732-162050	Fuse, 1.6A, 250V <b>G</b>
△ FI	5732-252050	Fuse, 2.5A, 250V <b>GB</b>
△ FI	5732-312036	Fuse, 3.15A, 125V <b>N</b>
△ SO1/	4474-157	AC Outlet, Switched,
△ SO2		Unswitched <b>U</b> <b>BK</b>
△ CO1	4443-712	Connector, Power Cord <b>G</b>
		<b>GB</b>
△ S2	4411-102729	Rotary Switch, Voltage
		Selector <b>G</b> <b>GB</b>
LUG-1	4211-4	Lug Terminal <b>G</b> <b>GB</b>

<b>PCB-1 MAIN P.C. BOARD</b>		
<b>RESISTORS</b>		
△ R439	5102-2204715	22Ω, 1/4W, FR
△ R440	5102-2204715	22Ω, 1/4W, FR
△ R445	5102-2204715	22Ω, 1/4W, FR
△ R446	5102-2204715	22Ω, 1/4W, FR
△ R447	5102-4704715	47Ω, 1/4W, FR
△ R448	5102-4704715	47Ω, 1/4W, FR
△ R449	5102-4704715	47Ω, 1/4W, FR
△ R450	5102-4704715	47Ω, 1/4W, FR
△ R451	5102-1004715	10Ω, 1/4W, FR
△ R452	5102-1004715	10Ω, 1/4W, FR
△ R453	5102-1004715	10Ω, 1/4W, FR
△ R454	5102-1004715	10Ω, 1/4W, FR
R455	5273-R33672	0.33Ω, 3W, CR
R456	5273-R33672	0.33Ω, 3W, CR
R457	5273-R33672	0.33Ω, 3W, CR
R458	5273-R33672	0.33Ω, 3W, CR
R461	5173-100571	10Ω, 2W, MR
R462	5173-100571	10Ω, 2W, MR
R467	5171-1R5571	1.5Ω, 1W, MR
R468	5171-1R5571	1.5Ω, 1W, MR
R621	5174-Z412228	41.2kΩ, 1/4W, MR
R622	5174-Z412228	41.2kΩ, 1/4W, MR
△ R632	5102-2214715	220Ω, 1/4W, FR

<b>CONTROLS</b>		
VR401	5101-30171920	300Ω
VR402	5101-30171920	300Ω
VR501/	5113-50385122	50kΩMN, Balance
VR502		
VR505/	5113-10486122	100kΩC, Bass
VR506		
VR507/	5113-50387122	50kΩC, Treble
VR508		

<b>CAPACITORS</b>		
C4	5341-688Z0956	6800μF /45V, EC
C5	5341-688Z0956	6800μF /45V, EC
C6	5345-226F041	22μF /50V, EC
C7	5345-106F041	10μF /50V, EC
C8	5345-107B041	100μF /10V, EC
C9	5345-105F041	1μF /50V, EC
C401	5345-476B0951	47μF /10V, EC
C402	5345-476B0951	47μF /10V, EC
C403	5345-227B041	220μF /10V, EC
C404	5345-227B041	220μF /10V, EC
C405	5359-2215851	220pF/100V, PC
C406	5359-2215851	220pF/100V, PC
C409	5359-1015851	100pF/100V, PC
C410	5359-1015851	100pF/100V, PC

Ref.No.	Part No.	Description
C411	5345-476F041	47μF /50V, EC
C412	5345-476F041	47μF /50V, EC
C413	5345-476F041	47μF /50V, EC
C414	5345-476F041	47μF /50V, EC
C421	5353-100934	10pF/500V, MC
C422	5353-100934	10pF/500V, MC
C501	5359-1015851	100pF/100V, PC
C502	5359-1015851	100pF/100V, PC
C509	5345-225F0951	2.2μF /50V, EC
C510	5345-225F0951	2.2μF /50V, EC
C511	5345-106C0951	10μF /16V, EC
C512	5345-106C0951	10μF /16V, EC
C601	5345-106C0951	10μF /16V, EC
C602	5345-106C0951	10μF /16V, EC
C603	5359-1215851	120pF/100V, PC
C604	5359-1215851	120pF/100V, PC
C605	5345-107D041	100μF /25V, EC
C606	5345-107D041	100μF /25V, EC
C609	5359-2025851	2000pF/100V, PC
C610	5359-2025851	2000pF/100V, PC
C611	5345-475F0951	4.7μF /50V, EC
C612	5345-475F0951	4.7μF /50V, EC
C615	5345-337E041	330μF /35V, EC
C616	5345-107D041	100μF /25V, EC
C617	5345-476D041	47μF /25V, EC

<b>TRANSISTORS</b>		
Q1	5613-2603(F)	2SC2603(F) or (E)
Q2	5611-1115(F)	2SA1115(F) or (E)
Q3	5611-1115(F)	2SA1115(F) or (E)
Q4	5613-2603(F)	2SC2603(F) or (E)
Q5	5611-970(BL)	2SA970(BL)
Q6	5611-970(BL)	2SA970(BL)
Q401	5613-2240(BL)	2SC2240(BL)
Q402	5613-2240(BL)	2SC2240(BL)
Q403	5613-2240(BL)	2SC2240(BL)
Q404	5613-2240(BL)	2SC2240(BL)
Q405	5613-2603(F)	2SC2603(F) or (E)
Q406	5613-2603(F)	2SC2603(F) or (E)
Q407	5613-2603(F)	2SC2603(F) or (E)
Q408	5613-2603(F)	2SC2603(F) or (E)
Q409	5611-970(BL)	2SA970(BL)
Q410	5611-970(BL)	2SA970(BL)
Q411	5612-646A(C)	2SB646A(C)
Q412	5612-646A(C)	2SB646A(C)
Q413	5614-666A(C)	2SD666A(C)
Q414	5614-666A(C)	2SD666A(C)
Q415	5613-945(K)	2SC945(K) or (P)
Q416	5613-945(K)	2SC945(K) or (P)
Q417	5614-667A(C)	2SD667A(C)
Q418	5614-667A(C)	2SD667A(C)
Q419	5612-647A(C)	2SB647A(C)
Q420	5612-647A(C)	2SB647A(C)
Q421	5611-1264(O)	2SA1264(O) or (R)
Q422	5611-1264(O)	2SA1264(O) or (R)
Q423	5613-3181(O)	2SC3181(O) or (R)
Q424	5613-3181(O)	2SC3181(O) or (R)
Q601	5613-2320L(F)	2SC2320L(F)
Q602	5613-2320L(F)	2SC2320L(F)
Q603	5611-999L(F)	2SA999L(F)
Q604	5611-999L(F)	2SA999L(F)
Q605	5611-1115(F)	2SA1115(F) or (E)
Q606	5611-1115(F)	2SA1115(F) or (E)
Q607	5613-2603(F)	2SC2603(F) or (E)
Q608	5613-2603(F)	2SC2603(F) or (E)
Q609	5613-2603(F)	2SC2603(F) or (E)
Q610	5613-2603(F)	2SC2603(F) or (E)
Q611	5611-817(O)	2SA817(O)

<b>DIODES</b>		
D1	5632-ERC402FL	ERC402FL
D2	5632-ERC402FL	ERC402FL
D3	5632-ERC402FL	ERC402FL

Ref.No.	Part No.	Description
D4	5632-ERC402FL	ERC402FL
D5	5636-IS2471	IS2471
D6	5635-HZ6A1L	ZD, HZ6A1L
D7	5636-IS2471	IS2471
D401	5631-IS2473	IS2473
D402	5631-IS2473	IS2473
D403	5632-S5566B	S5566B
D404	5632-S5566B	S5566B
D405	5632-S5566B	S5566B
D406	5632-S5566B	S5566B
D508	5635-HZ5C1	ZD, HZ5C1
D601	5635-HZ20-1L	ZD, HZ20-1L
D602	5632-S5566B	S5566B

**COILS**

L401	5991-7165
L402	5991-7165

**MISCELLANEOUS**

S501/ S502/ S503/ S504	4431-04167173	Push Switch, Phono, Tuner, Video/CD, Tape Monitor
J601/ J602/ J603/ J604/ J605/ J606	4486-15	6 Pin Jack, Phono, Tuner, Video/CD
J607/ J608/ J609/ J610	4486-46	4 Pin Jack, Tape In, Tape Out
TE501	4214-165	Terminal, Speaker System 1/2
CN404	4443-030185	Connector, 3 Pos.
LCN3	4163-0109020	Lug Terminal with Lead Wire

**PCB-2 POWER SWITCH P.C.BOARD**

△ C1	5361-1030419	0.01μF /AC125V, CC	U	BK
△ C1	5352-1030958	0.01μF /AC250V, MPC	G	GB
△ S1	4431-A01716	Push Switch, Power		
△	4472-0131	Fuse Holder		

**PCB-3 HEADPHONE JACK P.C.BOARD****RESISTORS**

R463	5171-471571	470Ω, 1W, MR
R464	5171-471571	470Ω, 1W, MR

**MISCELLANEOUS**

J401	4451-00159	Jack, Headphones
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**PCB-4 SPEAKER SWITCHES P.C.BOARD**

S401/ S402	4431-02047366	Push Switch, Speakers System 1/2
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**PCB-5 LOUDNESS SWITCH P.C.BOARD**

S505	4431-A027176	Push Switch, Loudness
CN407	4443-070185	Connector, 7 Pos.
CN605	4443-030185	Connector, 3 Pos.
CN606	4443-050185	Connector, 5 Pos.

Ref.No.	Part No.	Description
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**PCB-6 TAPE MONITOR INDICATOR P.C.BOARD**

D506	5637-GL5HD22	L.E.D., GL5HD22, Red, Tape Monitor
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**PCB-7 POWER INDICATOR P.C.BOARD**

D507	5637-GL5HD22	L.E.D., GL5HD22, Red, Power
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**PCB-8 VOLUME CONTROL P.C.BOARD****CONTROLS**

VR503/ VR504	5113-10419122	100kΩB, Volume
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**CAPACITORS**

C507	5359-1815851	180pF/100V, PC
C508	5359-1815851	180pF/100V, PC

**MISCELLANEOUS**

CN601	4443-030185	Connector, 3 Pos.
CN602	4443-030185	Connector, 3 Pos.

**KEY TO ABBREVIATIONS**

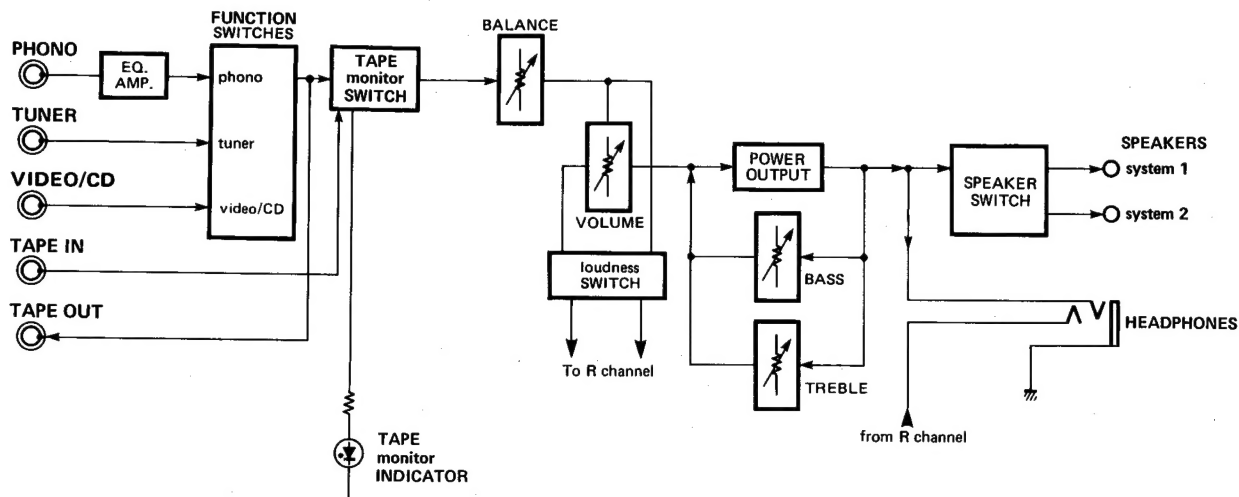
FR : Fuse Resistor  
 MR : Metal Resistor  
 CR : Cement Resistor  
 CAR : Carbon Resistor  
 EC : Electrolytic Capacitor  
 PC : Polypropylene Capacitor  
 MC : Mica Capacitor  
 CC : Ceramic Capacitor  
 MPC : Metalized Polyester Capacitor  
 SPC : Special Capacitor  
 ZD : Zener Diode  
 CLW : Connector with Lead Wire

U : U.S.A. model  
 G : General model  
 BK : U.S.A. model Black Version  
 GB : General model Black Version  
 N : Japan model

\* The part with the above mark is used only in the model made for the particular market the mark indicates.

⚠ SAFETY RELATED COMPONENT. USE ONLY EXACT REPLACEMENT PART AS SPECIFIED.

## BLOCK DIAGRAM



## PIN CONNECTION DIAGRAM OF TRANSISTORS AND DIODES

2SA970 2SC945 2SD667A 2SB647A 2SC2320L 2SC2240 2SB646A 2SD666A	2SA999L 2SA817	2SC2603 2SA1115	2SA1264 2SC3181	1S2473 ERC402FL 1S2471 HZ6A1L S5566B HZ20-1L HZ5C1	GL5HD22

## WIRING DIAGRAM

1

2

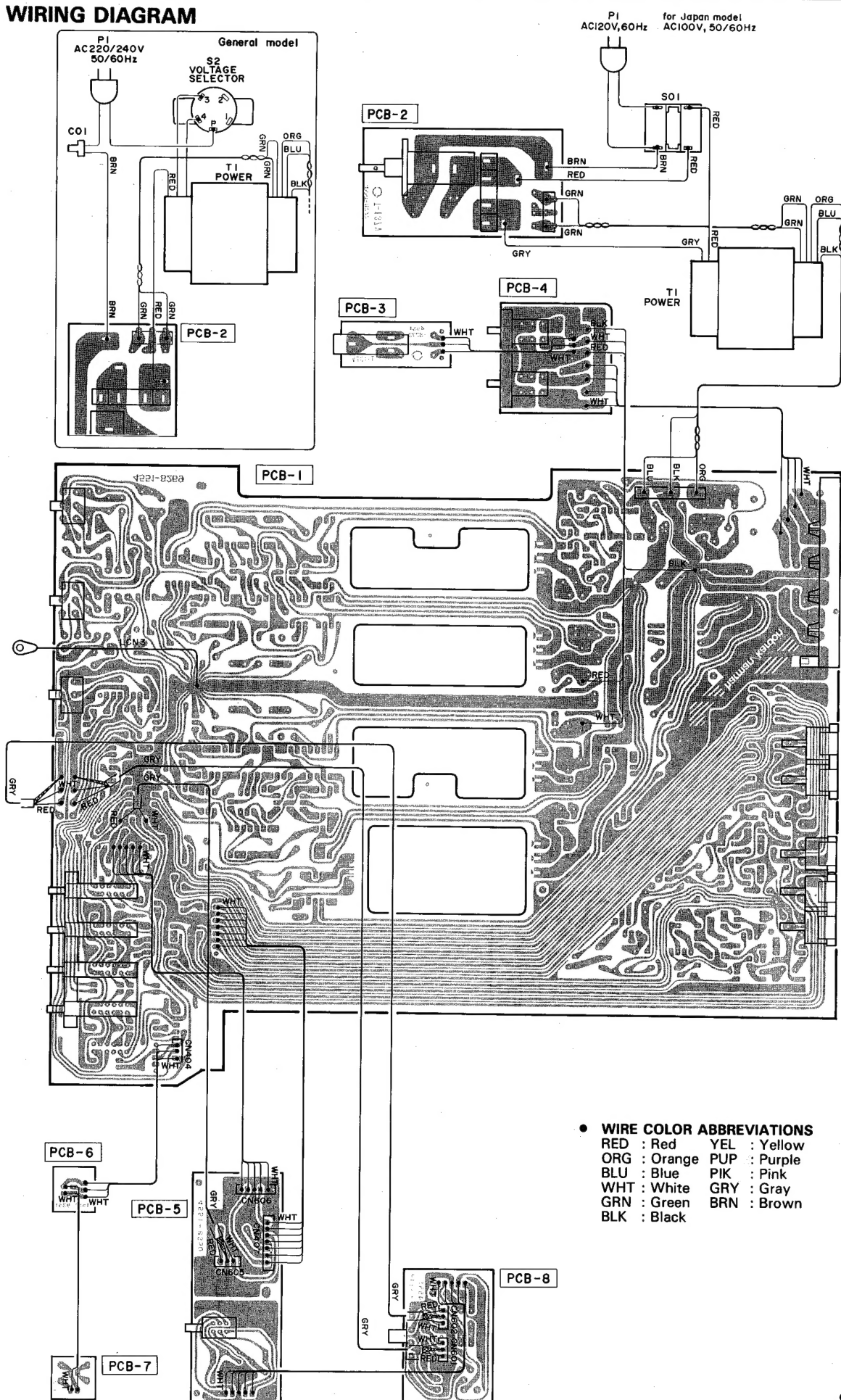
3

4

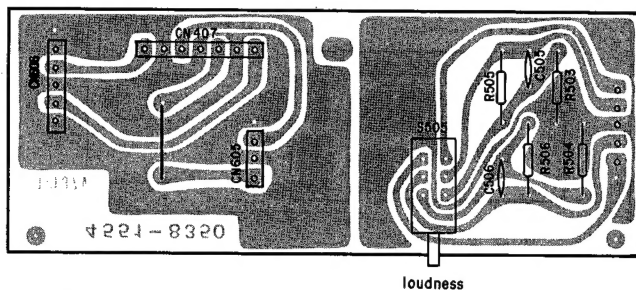
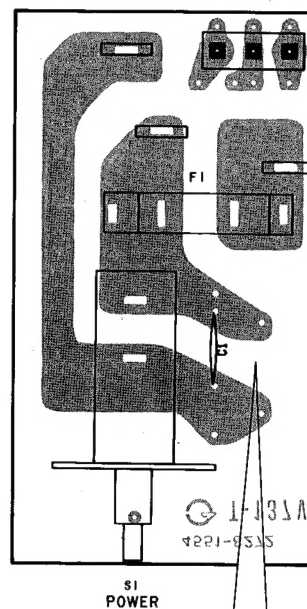
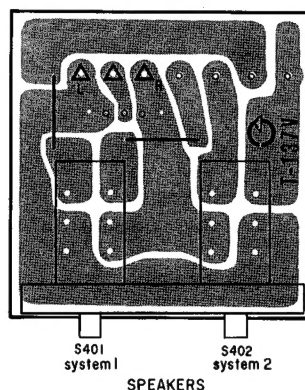
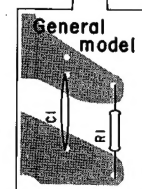
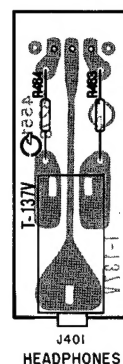
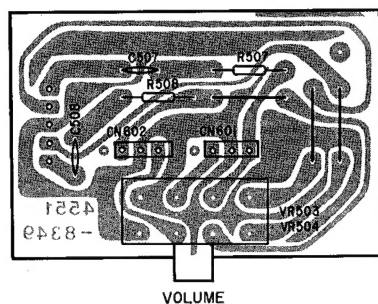
5

6

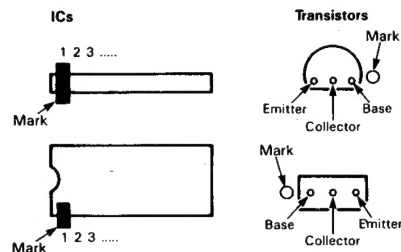
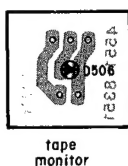
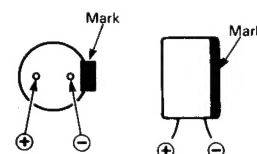
7



## P. C. BOARDS

**PCB-5 Loudness Switch P.C. Board****PCB-2 Power Switch P.C. Board****PCB-4 Speaker Switches P.C. Board****PCB-3 Headphone Jack P.C. Board****PCB-8 Volume Control P.C. Board**

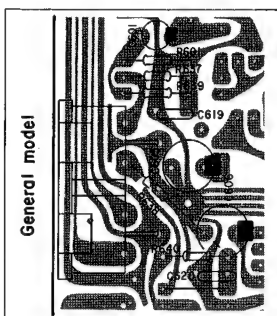
**NOTE:**  
In the figures of the P. C. Boards, a mark is provided on the base side of the transistor.

**PCB-6 Tape Monitor Indicator P.C. Board****PCB-7 Power Indicator P.C. Board**

1	
2	
3	
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7	

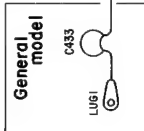
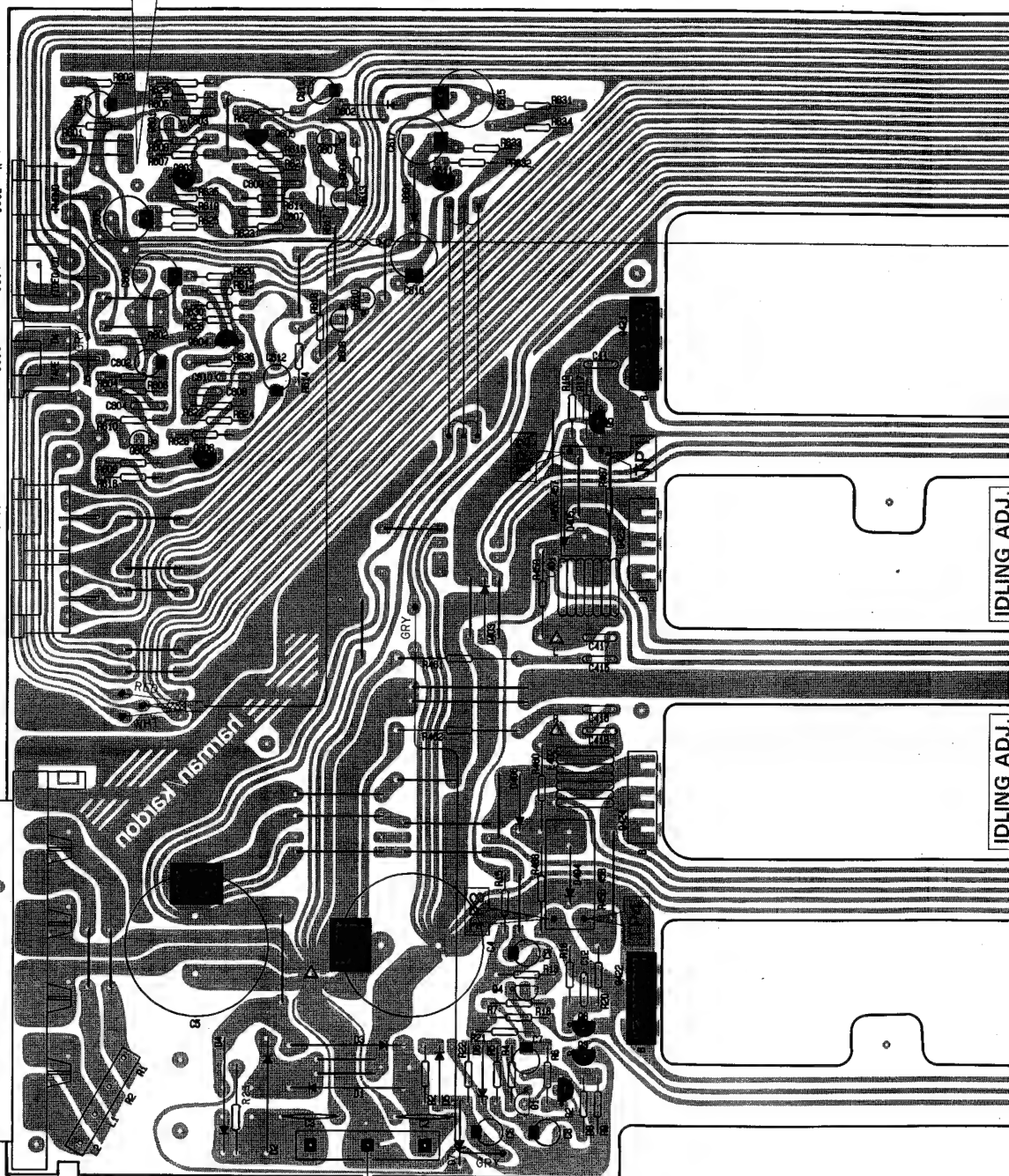


# P. C. BOARDS



PCB-1 Main P.C. Board

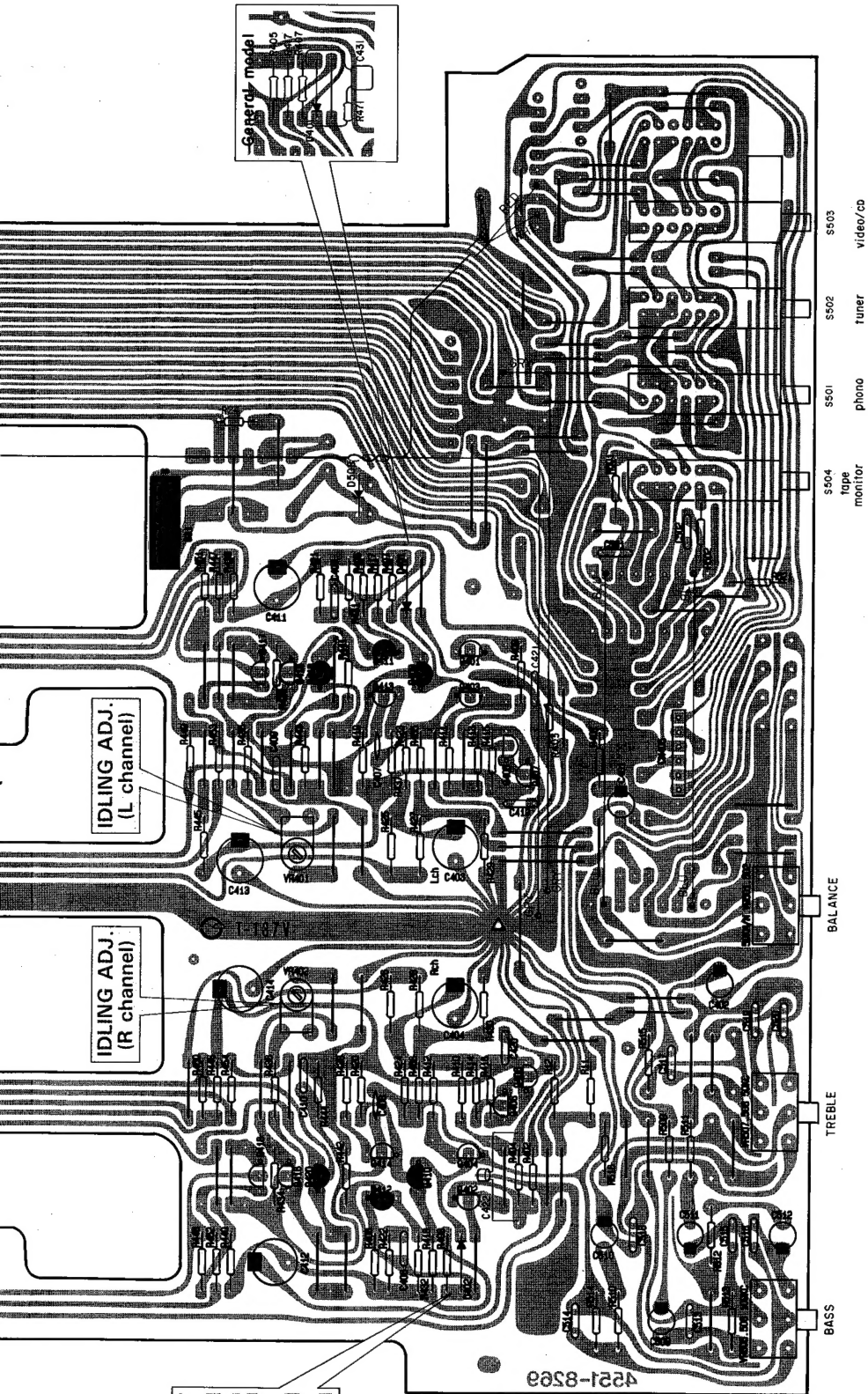
INPUT PHONO J601 L R  
 TUNER J603 J604  
 VIDEO/CD J605 J606  
 TAPE IN J607 J608  
 OUT J609 J610  
 LEFT RIGHT  
 TES01  
 SPEAKER SYSTEM 1/2  
 GND GND  
 LEFT RIGHT



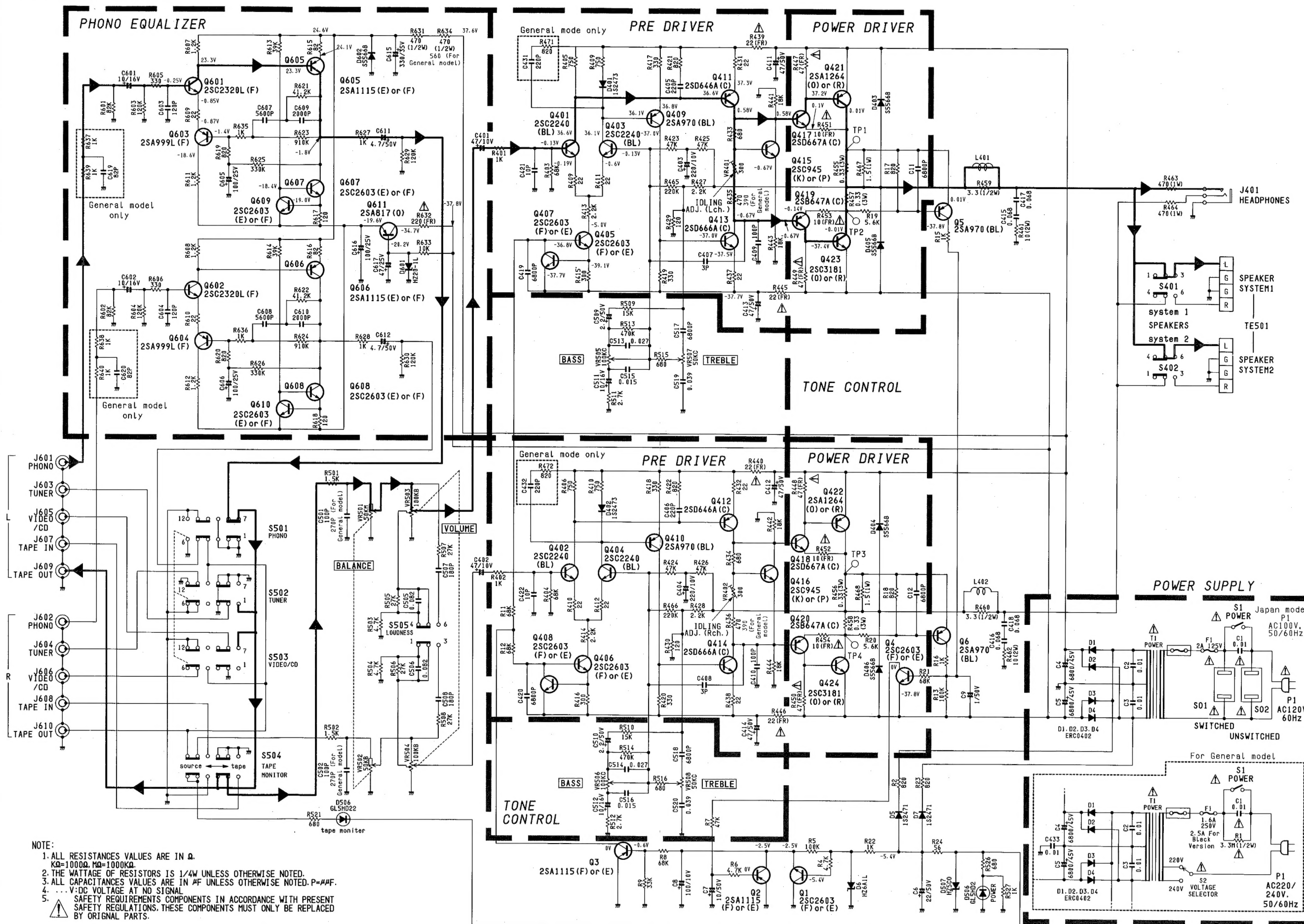
IDLING ADJ.

IDLING ADJ.

E F G H I J



## SCHEMATIC DIAGRAM



## PHONO EQUALIZER



1. ALL RESISTANCE VALUES ARE IN  $\Omega$ .  
 $K\Omega=1000\Omega$ ,  $M\Omega=1000K\Omega$ .
2. THE WATTAGE OF RESISTORS IS  $1/4W$  UNLESS OTHERWISE NOTED.
3. ALL CAPACITANCE VALUES ARE IN  $\mu F$  UNLESS OTHERWISE NOTED.  $P=\mu F$ .
4. ... V:DC VOLTAGE AT NO SIGNAL
5. SAFETY REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS, THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.

